

The School of Education of the City College of New York

ADVANCING SYSTEMIC CHANGE IN MATHEMATICS:

Efforts of the School of Education of the City College of the City University of New York

Established in 1847, the City College is considered the flagship of the City University of New York, the third largest university in the United States. The City College, located in Harlem, has always had as its primary mission to aid underprivileged yet able students in their quest for higher education. Today the College has a dual mission. The College fosters state-of-the-art research in areas such as mathematics and science, with some of its departments currently rated among the top 20 nationwide in their respective fields. At the same time, the College continues to reach out to the New York City community in order to provide both support and resources.

The School of Education of the City College offers a multitude of professional development initiatives in mathematics and mathematics education. Many of these programs are in conjunction with New York City Schools. These initiatives are primarily designed to improve teacher competence in both mathematics content and teaching methodologies, to enhance the public's understanding of issues relating to mathematics, and to improve and develop teacher research programs in the area of teacher education.

Programs Involving the Improvement of Teacher Competence in Mathematics Content and Teaching Methodologies

- **The Manhattan Mathematics Resource Center** – An educational partnership between the City College and the New York City Department of Education. Located on the campus of the City College, the Center provides support and technical assistance in mathematics on all levels to help community school districts and individual schools build capacity to affect meaningful change. Moreover, the Center provides a multitude of professional development activities and initiatives for teachers, supervisors, parents, and paraprofessionals throughout the New York City school system.
- **The Real World Math Summer Institute** - designed for mathematics teachers to provide activities to strengthen their knowledge of mathematics in the context of applications through site visitations to corporate partners such as IBM, Pfizer, Inc, Con Edison, Ellis Island, Verizon Technology Center, and the New York Stock Exchange provide team members with the opportunity to explore real world mathematics applications.
- **The Teaching Fellows Program** – This transition to teaching program offers qualified candidates an opportunity to study mathematics and methods courses and become certified and licensed mathematics teachers in the New York City schools
- **The Center for Excellence in Science, Technology, and Mathematics Education** – The center promotes (collaboratively with the School of Engineering, the School of Education, the School of Architecture) strong, nationally recognized effort to effect positive change in science, technology, and mathematics education. Center will provide professional development, especially in the content area, and develop new curricula and dissemination models for national impact.
- **The Mathematics Project** serves as an exemplary model and partnership between the New York City Department of Education and the City College. This program is specifically geared to meet the needs of middle schools and high school mathematics teachers throughout New York City.
- **Math in the City** – This NSF funded teacher enhancement project at the City College of New York is dedicated to the professional development of elementary school teachers in mathematics. Through the use of technology, teacher analyze student's work and observe both student and teacher behavior.
- **Mathematical Problem Solving: A High School and Middle School Project** - This project provides teachers with an intensive long-term development of problem solving skills in the context of mathematics content.

How the School of Education enhances public understanding of issues related to mathematics education

- **Series of Ongoing 'OP-ED' Articles** - Dr. Alfred S. Posamentier, Dean of the School of Education regularly corresponds with the public on relevant and controversial trends and issues pertaining to mathematics education. His series of ongoing 'OP-ED' articles, editorials, and news bulletins, many of which appear in the New York Times and other newspapers help to spur interest, disseminate ideas, and formulate public opinion in a variety of mathematical areas.

How the School of Education is Improving Teacher Research in the area of Teacher Education

Action Research

Many of the City College initiatives in mathematics education encourage teachers to embark on action research projects. Individual action research projects will encourage participants to explore and investigate in depth, areas of interest pertaining to the mathematics classroom. This will help identify a number of affective and cognitive variables, which may increase understanding of achievement patterns.

As an action researcher each participant will carry out the following:

- Select an area of interest linked to his or her teaching
- Continue to study the topic by reading and discussing and by identifying significant variables
- Accumulate pertinent data
- Study the data in terms of instructional decisions
- Modify instruction and progress by studying the modifications

Independent Study and Field Research in Mathematics Education

The focus of this City College graduate course is to have participants build on their action research and practicum course experiences and develop a field research project that demonstrates a capacity for independent work. Each participant will select a problem or issue in an area of mathematics, review the literature, research the hypotheses, develop a field research project, and communicate the results of the research. Therefore, using a theoretical framework, participants will develop the topic or problem through the use several possible methodologies, i.e., an experiment, a qualitative study, or a correlational study.